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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/627,016	07/25/2003	Joseph C. Zuercher	02-mAE2-229	3696
7590	09/09/2005			EXAMINER
Marvin L. Union, Esquire Eaton Corporation Patent Law Dept., Eaton Center 1111 Superior Avenue Cleveland, OH 44114-2584			BENSON, WALTER	
			ART UNIT	PAPER NUMBER
			2858	
DATE MAILED: 09/09/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/627,016	ZUERCHER ET AL
Examiner	Art Unit	
Walter Benson	2858	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 05 July 2005.
- 2a) This action is FINAL.                            2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-8, 10-14, 16-31, 47 and 48 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) 5-8, 12-14 and 16-31 is/are allowed.
- 6) Claim(s) 1-4, 10, 11, 47 and 48 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____.
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____.

**DETAILED ACTION**

1. Amendment B, received on 7/05/05, has been entered into record.
2. Claims 1-8, 10-14, 16-31, 47 and 48 are now pending.

***Election/Restrictions***

3. Applicant's argument that the connection of nodes by a power line as illustrated in Figure 7, falls under the broadest definition of "communicate" in that it results in the voltage being the same at each node is persuasive. Claim 10 is rejoined.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-4, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scott (US Patent No. 5,986,860 and Scott hereinafter) in view of Itimura et al. (US Patent No. 6,703,842 B2 and Itimura hereinafter).

6. As to claims 1-4, 11, Scott discloses an apparatus for determining parallel arc fault energy [col. 7, lines 64-67] in real time for a power circuit between a power source and a load substantially as claimed, the apparatus comprising:

means for determining a value of voltage at the load [claims 1, 11] (col. 6, lines 64-67 and col. 7, lines 64-67);

means for determining a value of current flowing in the power circuit to or from the power source [claims 1, 11] (col. 6, lines 8-21);

where the means for determining a value of voltage at the power source includes a predetermined value of voltage at the power source [claim 3] (Fig. 1; col. 5, lines 22-26);

Scott did not expressly disclose:

means for determining a value of the parallel arc fault energy from the value of voltage at the load and the value of current [claims 1, 11];

where the means for determining a value of the arc fault energy includes means for determining a value of voltage at the power source [claim 2];

where the means for determining a value of the arc fault energy includes means for determining a value of parallel arc power from the value of voltage at the load times the value of current, and means for determining the value of the parallel arc fault energy as a function of an integral of the parallel arc power [claim 4];

Nonetheless, these features are well known in the art and would have been an obvious modification of the system disclosed by Scott, as evidenced by Itimura.

Itimura discloses and apparatus and method for arc detection having:

means for determining a value of the parallel arc fault energy from the value of voltage and the value of current [claims 1, 11] (col. 12, line 61-64)

where the means for determining a value of the arc fault energy includes means for determining a value of voltage at the power source [claim 2] (col. 15, lines 1-19) to compare the power related parameters.

where the means for determining a value of the arc fault energy includes means for determining a value of parallel arc power [col. 6, lines 10-15] from the value of voltage at the load times the value of current, and means for determining the value of the arc fault energy as a function of an integral of the parallel arc power [claim 4] (col. 12, lines 61-67) to determine the total energy;

Given the teaching Itimura a person having ordinary skill in the art at the time of the invention would have readily recognized the desirability and advantages of modifying Scott by employing the well known or conventional features of measuring arc energy, such as disclosed by Itimura, in order to efficiently accumulate arcing energy over a plurality of arcing events and for the purposes discussed above.

7. Claims 10, 47, and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scott in view of Itimura as applied to claim 1 above, and further in view of Romano et al. (US Patent No. 6,654,219 B1 and Romano hereinafter).

Although the combine teaching of Scott in view of Itimura shows substantial features of the claimed invention (discussed in the paragraphs above), it fails to disclose:

where the means for determining a value of voltage at the load includes means for remotely communicating the value of voltage at the load to the means for determining a value of the parallel arc fault energy [claim 10];

where the means for determining a value of voltage at the load includes means for remotely communicating the value of voltage at the load by encoding the value of voltage through a power line carrier signal to the means for determining a value of the parallel arc fault energy [claim 47];

where the means for determining a value of voltage at the load includes means for remotely communicating the value of voltage at the load by encoding the value of voltage as a current through a power line carrier current signal to the means for determining a value of the parallel arc fault energy [claim 48].

Nonetheless, these features are well known in the art and would have been an obvious modification to the system disclosed by Scott in view of Itimura as evidenced by Romano.

Romano discloses a sensor to sense current changes and voltage changes in an electrical circuit having:

where the means for determining a value of voltage at the load includes means for remotely communicating the value of voltage at the load to the means for determining a value of the parallel arc fault energy [claim 10] (col. 8, lines 55-58);

where the means for determining a value of voltage at the load includes means for remotely communicating the value of voltage at the load by encoding the value of voltage

through a power line carrier signal to the means for determining a value of the parallel arc fault energy [claim 47] (col. 8, lines 65-67 and col. 9, lines 1-3);

where the means for determining a value of voltage at the load includes means for remotely communicating the value of voltage at the load by encoding the value of voltage as a current through a power line carrier current signal to the means for determining a value of the parallel arc fault energy [claim 48] (col. 9, lines 8-12).

Given the teaching of Romano, a person having ordinary skill in the art at the time of the invention would have readily recognized the desirability and advantages of modifying Scott in view of Itimura by employing the well known features of power line communication technology, such as disclosed by Romano in order to efficient transfer information on the power line from the voltage output port shown by Itimura to a remote monitor.

***Allowable Subject Matter***

8. Claims 5-8 and 12-14 are allowed. The prior art of record fail to teach in combination as claimed an apparatus and method for determining the value of the arc fault energy as a function of an integral of the parallel arc power including means for integrating a difference of the parallel arc power less a decay rate.

9. Claims 16-31 are allowed. The prior art of record fail to teach in combination as claimed an apparatus and method for determining arc fault energy having means for determining the

location from the value of voltage from the power source, the value of current, the value of voltage at the load, and a wire resistance per unit length or a wire conductance per unit length of the power circuit.

***Response to Arguments***

10. Applicant's arguments filed 7/05/05 have been fully considered but they are not deemed persuasive.

11. In the remarks the applicant argued in substance that:

- (1) Scott does not disclose means for determining parallel arc detection of the value of the voltage and current;
- (2) Itimura does not teach means for determining a value of parallel arc fault energy.

12. Examiner respectfully traverse applicants remarks:

As to point (1), see paragraphs above Scott (US patent No. 5,986,860) discloses means for determining a value of voltage at the load [claims 1, 11] (col. 6, lines 64-67 and col. 7, lines 64-67) and means for determining a value of current flowing in the power circuit to or from the power source [claims 1, 11] (col. 6, lines 8-21);

As to point (2) Itimura discloses means for determining a value of the parallel arc fault energy from the value of voltage and the value of current [claims 1, 11] (col. 12, line 61-64)

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter Benson whose telephone number is (571) 272-2227. The examiner can normally be reached on Mon to Fri 6:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (571) 272-2180. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Walter Benson  
Patent Examiner

September 6, 2005